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ORIGINAL ARTICLES.

ECTOPIA LENTIS WITH APPARENT POWER OF ACCOMMODATION.

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ACCORDING to d'Oench (Archiv f. Aug. IX 2 S. 31, Ref. Michel, 1881, p. 197, vol. 10) ectopia lentis has the following characteristics:

1. It is a developmental fault, cause not explained.
2. It affects always both eyes, generally symmetrical.
3. The lenses are generally clear, often smaller than normal.
4. The zonule may or may not be wanting.
5. Myopia in 25 per cent.
6. Heredity has been demonstrated as an etiologic factor.

Last year Dr. G. Griffin Lewis (Arch. of Ophth., Vol. xxxiii, No. 3), gave a report of sixteen individuals affected in six successive generations.

Record of Daniel H., September 25, 1904.—Patient is six years old. He does not learn readily in school. I find his corneæ large, the diameter of their base being 14 mm. Irides tremulous. Measurement with ophthalmometer unsat-

isfactory. The ophthalmoscope gives downward dislocation of the lens, right and left, with many bundles of the zonule to be seen converging from the ciliary region to the upper lense-margin and moving with the lens. All subjective tests are unsatisfactory.

September 6th—With + 15.D Sph. V = 15/42 R. or L. These glasses were prescribed.

I am indebted to Dr. A. E. Ewing for the record of the patient's father, which is as follows:

"Michael H. October 8, 1898. Never could see well. Was never able to do much at school on account of bad sight.

O. D. As 1. M vertl.
O. S. As 1. + M ax. 30° Javal, good light.

O. D. Aphakia, lens in lower portion of fundus.

O. S. Ectopia lentis downward and inward. Lens covers about ¾ of the pupil. Each iris tremulous.

O. D. Very poor vision, even when corrected.

O. S. V = 14/48. The same with + 1. cyl. ax. — 30°.

October 9th. Vision as on 8th. Pt. reads most easily with + 2. Sph. + 1. cyl. ax. 30°. After the use of Pilocarpine grij to ℥j for 1½ hours, O. D., with + 1. cyl. ax. 30°, V = 14/75. With — 1.5 Sph. added, V = 14/48.

1895, May 16th. O. D. No satisfactory result. O. S. V = 20/75. With + 1. cyl. ax. — 30°, V = 20/75 +.

I have advised strongly against any surgical interference with the eyes unless there are other indications for it than at present. He will bear no change in glasses."

Marie H., daughter of Michael, was 6½ years old when she came to me in February, 1898. She has never seen as well as others. Ophthalmometer—As 1. M. vertl. R. & L. This measurement was doubtful, because patient had never learned to fix accurately. Irides are tremulous, O. D. less than O. S. The ophthalmoscope shows downward dislocation of the lenses. The fibres of the zonule of Zinn are plainly seen extending from above downward to the lens-margin. The lenses float upward with each movement of the eye. With + 16 D. Sph. R. or L., V = digits at 16 ft. Later with + 16 D. Sph. R. or L., V = 15/42. I prescribed + 16 D. Sph. R. or L.

April 12. O. D. V = 15/42. Glass bears no addition. O. S. V = 15/30. Glass seems to bear addition of + 1.5 Sph.

1899, July 12th. With + 17 D. Sph. R. or L., V = 15/24. I ordered + 17 D. Sph. R. and L.

October 26th. With glasses, V = 15/19 R. or L. With these the patient reads Jaeger No. 2 by turning her head to one side. Ophthalmometer—O. D. about 1 D. M. vertical. O. S. V. very unsteady.

1900, September 26th. Patient reads Jaeger No. 1 at 3 in. and at 1 ft. with the glasses.

1901, April 11. Wishing to learn if the ciliary muscle were sufficientiy developed to change the curvature of the cornea by constriction of its base (which may barely be possible in so young a subject), I examined both eyes with the ophthalmometer, but found no change in the size of the images of the mires, whether the patient looked at the edge of the tube or passed it into the distance.

I then used atropin several times, after which patient reads J. 1 at 6 in. as before its use. She also closes down the brows and lids when reading, either for the purpose of pressure or in order to shut out light. When I raise her brow with my thumb, she can no longer read. After relaxing the pressure, she reads J. No. 1 with + 4 D. Sph. added. Upon removing + 4 D. Sph., patient cannot at first see J. 1, but after contraction again, she can do so. This test then seems to show that the pressure of extrinsic muscles was at least a factor in enabling her to read.

1902, October 23rd. O. D. with + 17 D. Sph. V = 15/15. O. S. with + 18 D. Sph. V = 15/15. I ordered the change of the glass O. S. to + 18 D.

The chief points of interest regarding this case are:

1. The dislocation is congenital and downward. According to Lippell, lateral and upward displacements are usually congenital, downward, almost constantly acquired, *i. e.*, caused by trauma or disease (Ref. G. Griffin Lewis).

2. The increase of visual acuity from 15/42 R. & L. with the only glass accepted by the patient, to 15/15 within three years and that in an eye so highly hyperopic, a condition which is in itself an expression of a want of development.

3. The seeming power of accommodation, the source of which ability has been much discussed by many writers.

In Michel's Jahresbericht, 1872, I find that Donders demonstrated that the optical focussing of the aphakic eye for near objects remains the same, but the narrowing of the pupil comes to the aid of distinct vision by diminishing spherical aberration:

Also that Foerster (Klin. Monatsbl. f. Aug. X, p. 39–56), however, reaffirmed that "especially youths attain, after some years, a certain degree of accommodative ability. But a source of error has been recognized in the fact that the reading of medium or fine print within a certain range only shows a greater aptitude in perceiving indistinct images, but in no way proves a change in refraction. A maximum perception must be maintained at different distances to demonstrate a change in refraction, and that in the absence of spherical aberration. The coincidence that in youth accommodation is so effective and that in youth the apparent accommodation of aphakics is most pronounced proves nothing, because of the presence of the lens in the one case and its absence in the other. Clearer media, more movable pupils, greater skill in deciphering, Ref. gives as possible aids to more perfect perception."

Foerster gave the occasional micropsia after operation as an evidence of accommodation. Ref. "admits the probability that a contraction of the ciliary muscle does stretch and displace the choroid but holds that the micropsia does not prove any optical focussing."

Abadie (Journ. d'Ophth. 1, p. 427, Ref. Michel, 1872) believed that the contraction of the pupil explains a greater part of apparent accommodation, saying that for reading one needs no sharp images and that within limits spherical aberration need not be suppressed.

Coert (Utrecht Bijbladen [Ref. Michel]) adjusted the eye for a certain distance by means of a glass. He then proved that visual acuity decreased as the distance increased from this focussing distance. If at a given distance within the apparent range of accommodation, a glass is placed quickly before the eye corresponding to this distance the print appears sharp and black which before was scarcely recognized. This could not have been the case if perception had been by

means of accommodation. Atropine diminished the apparent accommodation only so far as the pupillary surface became more unfavorable; once he even found an increase. Individual differences in the range of "distinction" rest upon differences in size and mobility of the pupil and other side influences which affect vision, *e. g.*, spherical aberration, etc. (The greater the acuity just so much more rapidly does it decrease by insufficient focussing, because the small letters used do not bear any spherical aberration.) The gradual increase of apparent accommodation after operation is explained by the real increase in vision. He demonstrated, both in reading tests and by exhibiting spherical aberration circles on a screen, that even aphakics had a certain range of acuity, in spite of diffusion circles.

Schweiger, 1875, says: "Since under physiological conditions the phenomena observed in the lens at least play the most important role in accommodation, the conclusion appears unavoidable that aphakia must result in a total loss of accommodation." "Coccius lays weight upon the fact that in many men the eyes advance somewhat in near vision and recede in distant vision, and since he established the same in a case observed by him of accommodation in aphakia, he considers it probable that by retraction of the globe by means of the recti, and pressure from behind, the eye becomes farsighted, by advancement of the eye by means of the oblique and discontinuance of pressure, with slight lengthening of the eye-axis, accommodated for near seeing."

Landolt maintained that any apparent accommodation which takes place is brought about by some change in the distance of the cataract-glass from the eye, stating, e. g., that the power of a + 13 D. Sph. is increased to + 16 D. Sph. by removing it 35 mm. forward.

In our case this possibility was entirely eliminated, the glass remaining constantly at one distance with the exception of, perhaps, a few mm. by turning the head and looking through the side of the glass.

Schloesser (Muench. med. Wochenschr., Michel, Jahresb., 1893), found accommodation in several aphakics. One read with distance-glasses the finest print, J. 1 at 50 cm. Young aphakics have the ability more marked than older. He be-

lieved that he excluded such sources as inclining the head, or page, and clinching the lids, concluding finally that the most probable cause was the lengthening of the globe by pressure from the external muscles, hence older patients have less range, because of the greater rigidity of their sclera.

Hofhammer (Michel's Jahresb. 1894), examined 40 aphakics and found considerable accommodation, especially if the operation had been done some time before testing. Age had no appreciable influence.

Fuchs (Textbook, pg. 699). "The aphakic eye is moreover destitute of accommodation. The eye is incapable of altering its refraction. Hence it follows that by any single glass, the latter is corrected for a single distance only."

Von Arlt (Graefe–Saemisch Bd. III, 1, pg. 250). "If aphakic eyes possess any accommodation, it can only result from a change in the form of the globe," and he adds, "after extraction the visual axis might be somewhat longer, the equatorial diameter shorter."

Schoeler (Ref. Michel, 1875, p. 83), examined 10 cases "measuring the range within which the finest Burchardt point-tests (still recognizable) could be seen with a cataract-glass without noticeable suffering in distinctness. This range was so small that all thought of an accommodative influence must be given up (5 1/2 in. to 5 in. of 4 1/4 in. to 3 3/4 in.)."

Mauthner declared against aphakic accommodation after using Burchardt's point-tests and ophthalmoscopic examinations.

O. Walter (Archives of Ophthalmology, Nov., 1900) reasoned as follows: By contraction of the ciliary muscle and with it of the choroid (Hensen and Voelckers) the vitreous comes forward against the iris and in some cases protrudes through the pupil into the anterior chamber the size and shape of its bead varying with the size of the pupil. Considering the refractive index of the aqueous and vitreous as almost equal, he computes the necessary increase in the length of the globe at 2.7 mm., in order to read at 30 cm., if such increase in length were the only factor in accommodation. If, on the other hand, focussing is effected by a bead of vitreous, the surface of the latter must have the very small radius of 0.34 mm., and project through a pupil of

only 0.68. Therefore, he says that it is likely that the index of vitreous in such cases is greater than that of the aqueous.

Lohnstein (Knapp–Schweigger, 1900), answered that the spherical aberration of such a bead would be of too high a degree for distinct vision, and refers him to Boehmer's statement that a 1 per cent. salt solution has only an 0.00146 higher index than distilled water. "Therefore, the difference in the amount of salt present in different persons could alter the refractive index no more than + 0.00015."

It seems then that all of the theories which endeavor to explain aphakic accommodation by supposing some phenomenon in the eye, as, e. g., a change of shape in the globe, are opposed by as strong arguments as are brought forward in their favor. There remains only one factor not yet mentioned in this connection as far as I know, viz., the tipping of the cataract-glass or the equivalent thereof, looking obliquely through it, causing a greater curvature in one meridian, and visual acuity is increased by the ability of the patient to overcome spherical aberration through diminution of the palpebral fissure. Dr. John Green in the Transactions of the American Ophthalmological Society, Vol. V, Part III, in an article entitled "An Elementary Discussion of Some Cases of Centrical Refraction through Tipped Spectacle-Lenses," has given us a method of computing the difference in power produced by tipping, closing with a table of refracting values for the tipping-angle from 5° to 45°.

Since this paper was written, both of these patients have again been examined.—Daniel has now a vision of 15/30 + R. or L., and can now distinguish some letters from Jaeger No. 1 by turning the head to one side.

Marie can now read J. 1 without turning the head or closing the lids and raising the brow and the lid has no influence on her vision.

DOUBLE RADIAL RUPTURE OF THE IRIS.*

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THIS case of double radial rupture of the iris is very remarkable and, so far as I have consulted the literature on the subject, there is only one which corresponds to it. In that case, which occurred in the practice of Dr. Bünger,[1] in 1821, the left eye was struck by a chain, causing an artificial pupil which could be distinguished from one made by an operation, only by a band of iris remaining at the ciliary margin. At first, sight was very much impaired, probably from intraocular hæmorrhage, but perfect vision was finally regained.

My case is as follows:

History.—G. H., age 10, was first examined November 12, 1902, and gave the following account of the accident: He was struck by a BB shot from an airgun at a distance of about five feet. The shot struck the edge of the lower lid of the left eye at about its anterior third. It embedded itself in the bulbs of the cilia and almost passed through. It was removed at home by squeezing the lid, when it dropped out. I saw the boy five days later and found a well-defined coloboma of the iris as clean and sharply cut as if it had been done by an expert. It was about 4 mm. in width. There was no blood in the anterior chamber, and only a moderate injection of the conjunctiva. Lying in the coloboma was a mass of iris tissue which was entirely separated from the iris on both sides as well as from its ciliary attachment (Fig. 1). The lens was opaque and vision was reduced to perception of light, probably on account of intraocular hæmorrhage. Tension was normal and the eye not painful. In my judgment the posterior lens capsule was ruptured, as there was no evi-

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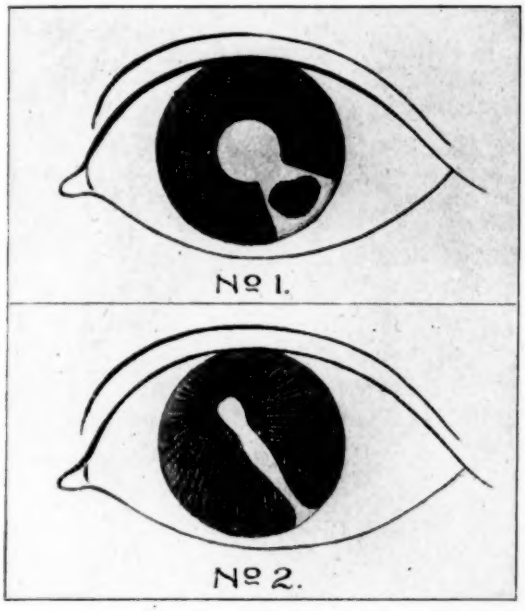
* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section of Ophthalmology.

1. Graefe and Walthers: Jour. d. Chir. und Augenheilk., vol. ii, p. 669.

dence of soft lens substance in the anterior chamber at any time. Atropin was ordered.

In the course of time the edges of the coloboma gradually approached each other and the upper and inner portions of the iris drew up, leaving a long slit-like scar marked by a gray line of cicatricial tissue. (Fig. 2). The iris mass shriveled up and disappeared under the approaching edges of the iris. In three months he was able to count fingers at one foot and at the end of a year he could count fingers at three feet.



The iris at the end of the scar responds to light and probably an iridectomy made at that point would restore useful vision.

I shall not attempt a review of the literature on this subject, but will only refer to the various papers which have been written.

Dr. E. Franke[2] reports 13 cases of rupture of the sphincter iridis, including an original one in his own practice. He discusses the mechanism of rupture of the choroid, and gives the opinion of some of the most eminent men on that subject.

Prof. L. Weiss and Dr. W. Klingelhoeffer[3] collected 31 cases of rupture of the iris, including two original ones. They review the literature up to date. Their Case 1 is credited to Stellwag, but it really belongs to Bünger. Stellwag reviewed this case in an article published in 1855, as stated in the paper by Dr. E. Franke.[2]

The 31 cases are arranged chronologically, giving age of patient, name of author, cause of injury, condition of iris and pupil and complications. It is a valuable collection, and one can, at a glance, review this interesting group of accidents.

Dr. George Levinsohn[4] of Berlin, in a paper on "Indirect Ruptures of the Iris," reports four new cases. In the first, there were three ruptures of the pigmented pupillary margin; in the second, there was a slight rupture of the pupillary margin and multiple perforations of the iris in the region of the dilator; in the third case, there were multiple slight ruptures of the pigment border; in the fourth case, the iris was atrophic from recurrent attacks of iritis. An iridectomy was attempted, but only small bits of iris could be removed. As a result of the operation, the pupil was drawn upward and the lower portion of the iris near its ciliary margin ruptured, thus giving him a small pupil. The case does not properly belong to the class of traumata as do the others.

Dr. George C. Harlan[5] reports a case of "Rupture of the Iris at the Pupillary Margin and in Continuity from Contusion of the Eyeball." It is accompanied by an excellent illustration in colors. There was a notch in the temporal border of the iris, which extended to within 3 mm. of its periphery. There were also thirteen serrations in the margin of the pupil, which could be seen in favorable light. The lens was not injured. No iritis followed, and the eye recovered excellent vision. To this case he adds five more, stating that they formed six instances of pupillary rupture, and two of radiating rupture in the continuity of the iris. These cases are tabulated by Weiss and Klingelhoeffer.

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2. Graefe's Archives, vol. xxxii, No. 2, p. 261.
3. Arch. f. Augenh., vol. xxxix. 1899.
4. Archiv f. Ophthal. vol. xxxii, 1903, p. 135, translated by Dr. Ward A. Holden.
5. Trans. Amer. Ophthal. Society, vol. vii, p. 640.

I find the following new cases which are not mentioned by Weiss and Klingelhoeffer.

Dr. W. F. Mittendorf[6] gives in detail a description of a patient who was accidentally struck in the eye by a stone, and, as a result of the injury, had six distinct ruptures of the pupillary border.

Woodward[7] relates a case of rupture of the pupillary border of the iris extending through one-half its width. There was an accompanying rupture of the choroid, which was in evidence when the intraocular hæmorrhage had absorbed. The eye made an excellent recovery, with perfect vision with the aid of + cyl. 0.5.

If, to the cases tabulated by Weiss and Klingelhoeffer, we add the four reported by Levinsohn and one by Woodward and one by Mittendorf, and my own case, we will have a total of 38 cases.

This probably does not represent all the cases of slight ruptures of the pupillary pigmented border, or of ruptures in continuity, which very easily escape observation. The elasticity of the iris is such that the slight tears readily close and are thus overlooked.

The question as to whether the rupture occurs in the direction of the force or perpendicular to it has been ably discussed by the authors mentioned.

It seems evident that no rule has ever been or probably ever will be formulated which will explain all of these cases. An eye is struck by a fist or by a flying fragment of wood or metal, and one can not tell definitely what part of the eye was most impinged on. The rupture of the iris may occur on the side of the injury or on the opposite side, and this result is governed by laws which are not yet well explained.

In my case there can be no question about the rupture occurring in the direction of the force and not perpendicular to it. The entrance of the pellet of lead into the margin of the lid and the location of the iridectomy coincide exactly. The detached piece of iris was lying in the coloboma plainly visible and could not be mistaken. The gray background of the opaque lens left no room for doubt.

6. Trans. Amer. Ophthal. Society, 1899, vol. viii, p. 541.
7. Archiv f. Ophthal., 1897, vol. xxvi.

REPORT OF SEVERAL EYE CASES.*

By L. R. Culbertson, M. D.,

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CONGENITAL OPTIC ATROPHY.

CASE I.—Rev. W. T., age 37, minister. December 13, 1904. States that during his sermon last Sunday he suddenly lost his speech for about ten minutes. Never had laryngitis (examination of larynx shows no laryngitis or paralysis of vocal cords). Talks all right now. States that about eight years ago had nervous prostration and that when he would try to go to sleep he would "hear demons of hell," and that this hallucination of hearing would disappear as soon as he would open his eyes. Has not had this since then. States that since an infant he has had to hold objects to within two inches of his eyes to read them, and that while studying divinity, and since then, he has read by holding a very large hand magnifying glass up to his eye and the print close to that to read. When he reads the paper touches his nose. His myopic astigmatism would not make him do this. He says his father was a drunkard and died blind and his sight was bad very early in life.

Pupils sluggish to direct light reflex. Consensual pupil reflexes normal, but sluggish, in all portions of the retina. Pupils contract normally to accommodation. No paresis of ocular muscles. Patellar reflexes exaggerated; no anaesthesia or paraesthesia, muscular sense normal. Romberg sign absent, walks in straight line eyes closed, no tabes. Carries a glass of water to lips without tremor, no nystagmus, no Charcot's disease.

Says he has recently had attacks in which he could not say what he wished to for some fifteen minutes (Aphasia). Also had an attack in which he could not recall the name of a dollar bill (said he could not remember what it was—amnesia). These attacks only lasted a short time.

* Read before the meeting of the Eighth Councilor Dist. of Ohio Med. Ass., January, 1905.

Vision Rem. with — .75 Dcy. 45 equals XX at 2 inches.
L. E. — 2 Dcy. 135 equals XX at 4 inches.
Reads with magnifying glass. Sn. 1.5 at 1 inch.

Retinoscopy shows no hypermetropia. Ophthalmoscope shows each optic disc very pale and shows very marked atrophic cupping. Vessels quite small both on disc and in stroma retinæ.

Diagnosis. Partial optic atrophy. Could not give encouragement, but put on strychnia, etc. Strychnia did not agree and bromide was substituted with benefit. I neglected to state that he never had syphilis and there is no evidence of it, either hereditary or acquired. Never used alcohol or tobacco.

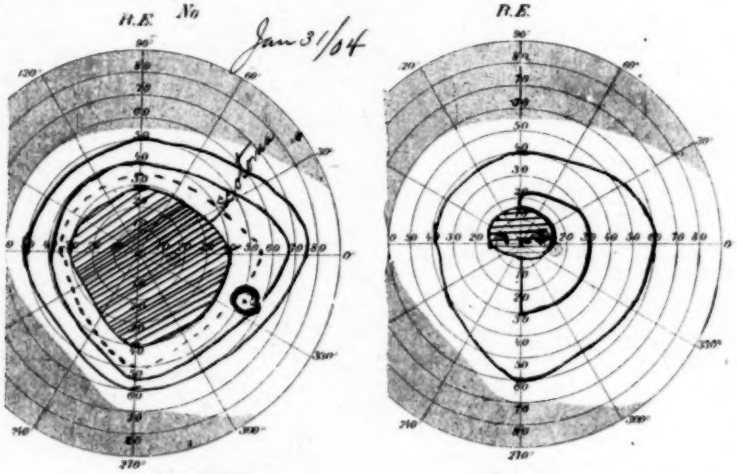
Visual fields not tested as he cannot tell any colors. Optic atrophy not connected with present brain trouble. His aphasia is due to defective intra-cranial circulation from thickening of arteries, or there is degeneration in the neurons which may result in paralysis or general paresis. Treatment advised was small doses of strychnine in conjunction with bromide.

MIXED MONOCULAR OPHTHALMOPLEGIA.

CASE II.—Mrs. B. D., age 41, November 3, 1903, states that the left eyelid has been slightly droopy for some weeks, but yesterday the lid failed to open. Has been doing all of her housework and is very much run down in health. Says she has not had rheumatism, but complains of supra-orbital neuralgia and a pain along left side of nose. Also has neuralgia in left shoulder (musculo-spinal neuralgia—the latter symptom is nearly always found in cases of neuritis, so the neurologists tell us). Has complete ptosis of left eye and complete paralysis of left internal, superior and inferior recti and inferior oblique and sphincter iridis and ciliary muscle. This pupil does not contract to light but does to eserine. Consensual pupil reflex normal. All movements of right eye normal. No ptosis or paresis of iris or ciliary muscle. No anæsthesia or hyperæsthesia. Could not test color field of left eye to-day, but subsequent test showed it was not hysterical. Color field of right eye not hysterical. Color field of left eye taken January 14, 1904.

Ophthalmoscopic examination R. E. normal. L. E. slight haze about disc. Vessels normal in size and outline. Vision Rem. both normal. Urine s. g. 1003, no albumen, no sugar, no tube casts. Excess bladder epithelium, some uric acid.

Seat of lesion neuritis of trunk of third nerve (left) either in cranial cavity or orbit and due to neuritis. There is no history of syphilis. The absence of "choked disc" and the limitation of the symptoms to one eye and one nerve preclude diagnosis of tumor. Patellar reflexes normal. Romberg sign absent, walks in straight line, eyes closed; no tabes. Mind



—— White
Middle line green
- - - Blue

—— Green
Red outside

and memory normal. The only motion of the left eye is outward. With + 4.5 D. Sp. to neutralize accommodative paresis she reads J. I.

Treatment: Strychnine in large doses, hypodermically and by mouth, absorbents, diuretics and diaphoretics.

January 14, 1904. No ptosis now, eye tires easily in looking up. Some paresis of accommodation and pupil.

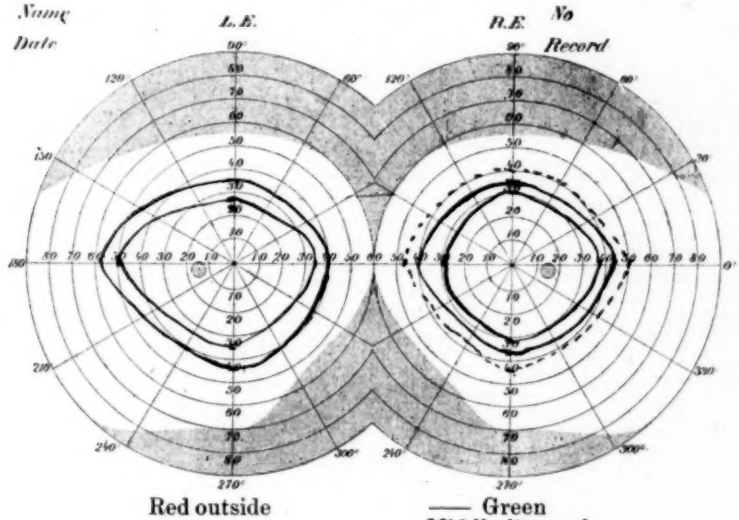
June, 1904. No paresis save slight paresis of accommotion. Pupil normal.

THROMBOSIS OF CENTRAL VEIN OF THE RETINA.

Case III.—Mrs. J. S., age 77, January 25, 1904, suddenly became blind in the right eye while stooping and pok-

ing the fire. She has a fully mature cataract in the other eye and incipient cataract in the right eye. Sees one-half of my face very dimly with right eye. Says everything looks blue, mottled with gray and yellow. Urine s. g. 1012, no albumen, sugar or tube casts. No syphilis. She has been very rheumatic, gouty and dyspeptic for many years. Sees light on nasal side of right field and all parts of field with left eye. T. normal both.

Ophthalmoscopic examination: R. E. pupil dilates regularly to atropine; no synechia; incipient cataract, with + 18. D. in ophthalmoscope fundus distinct. Vitreous shows a few



Red outside

—— Green
Middle line red
- - - Blue

opacities (with + 1 sp.). Arteria centralis retinæ and smaller arteries somewhat enlarged. Vena centralis retinæ and all smaller veins from three to four times normal size. Numerous retinal (venous) hæmorrhages, especially on the nasal side and near disc and macula; a few minute hæmorrhages on temporal half. Central scotoma for colors and light, also color fields contracted. (See charts.)

The family desired consultation and Dr. C. F. Clark of Columbus was called and made the same diagnosis.

Treatment: Mercurial inunctions, Burnham's iodine, general massage, arsenauro for several months, with steady improvement, then stopped all medicine. Seven months after she

could go alone on the street, work about the house and could read headlines on newspapers, but could not read smaller type because of scotoma.

Ophthalmoscopic examination made December 4, '04, shows all veins normal in outline and nothing to show that she ever had any thrombus or hæmorrhages save one or two very minute silvery spots on retina (nasal half) and one on macula. Veins apparently performing their function in a normal manner. The recovery was due either to early absorption of a portion of thrombus or to a collateral circulation having been established before the thrombus in the trunk of the vein was absorbed. Coates (Report of meeting, 1904, of Ophthalmological Society of the United Kingdom in the Lancet, July 16, 1904), reports "five cases with preparations. In four of these an organized thrombus was found in the central vein; in three of them complete obliteration of the vein in a portion of its course had occurred from this cause; and in one of them the manner of re-establishment of the lumen by the accession of collaterals from the trabeculæ of the nerve was well shown. In the fourth case, canalization and not obliteration of the thrombus had occurred. In the fifth no thrombus was found, probably because the optic nerve was cut longitudinally in the usual manner and not transversely, as was desirable when a lesion of the central vessel was suspected."

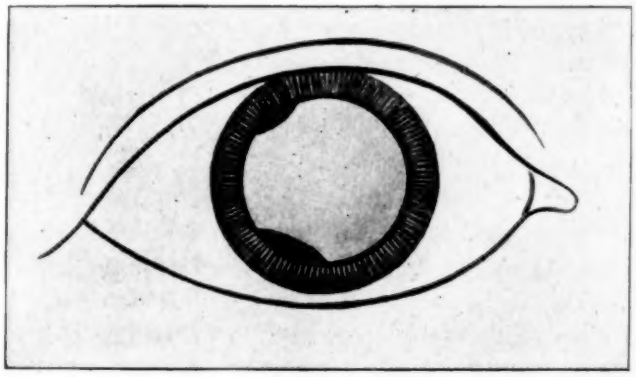
Dr. H. Knapp of New York giving statistics in 1884 (Arch. Ophth. XIII 1, p. 83) states "that the mortality in published cases is high, 29 per cent., and the prognosis as to sight exceedingly bad; 16 per cent. of the survivors lost the sight of both eyes, and 60 per cent. of them lost the sight of one eye. Incomplete recovery of sight occurred in 12 per cent. and complete recovery in 12 per cent."

DOUBLE COLOBOMA OF THE LENS WITH REPORT OF A CASE.

DR. S. C. AYRES.

CINCINNATI, OHIO.

COLOBOMA of the crystalline lens is one of the curious and interesting congenital defects of the eye. When it is associated with other anomalies as coloboma of the iris and choroid it is very likely to be detected if the eye is critically examined. When, however, it is not thus associated it may readily escape recognition. In Graefe's Archives, vol. 48, p. 558, Dr. Richard Kaempffer of Hamburg has a very inter-



esting and exhaustive article on Congenital Coloboma of the Lens. He reviews the literature on the subject from 1830 to 1899, the date of his publication. He collects 132 cases, including three of his own. The article is illustrated by 31 drawings, showing the peculiarities of the coloboma in the various rare cases. They present a very interesting study, and some of the illustrations show very exceptional defects in the development of the lens. These defects are sometimes in the shape of a triangular notch in the edge of the lens, or a saddle-shaped loss of substance, or a double notch

with curved edges. Among them is a very unusual case, originally reported by Dr. Christin of this city, in which there were three indentations in the edge of the lens, separated by two pointed elevations. From the tips of these elevations there extended directly outward delicate threads evidently remains of the zonula. In a case reported by Otto Becker (Archiv Oph., vol. iv) there was a horseshoe-shaped furrow in the lens. In eight of these cases reported there was a double coloboma of the lens. Two of the three cases reported by Dor belong to one person, he having a double coloboma of the lens in each eye. Thirteen times both lenses were involved. The location of the coloboma is probably in a majority of cases below. In Kaempffer's list, where the locality is specified, it is below 53 times, above 11 times, outward twice, inward 5 times, below and in 6 times, below and out 8 times, once above and in and twice above and out. My own case is as follows: Miss L. H., not 18, was referred to me by Dr. J. C. Culbertson, December, '03, for a refraction test, as she had some asthenopic symptoms. R. E. V. = 15/30. L. E. V. = 15/10. With the shadow test she had mixed astigmatism — cyl. 0.5 ax. 25° ⌒ + cyl. 1 ax 115 V = 15/20. In the left eye she had myopic astigmatism — cyl. 0.5 ax. 180° V = 15/15. In examining her by the direct method after the use of the mydriatic I noticed a double coloboma of the right lens, one break in the normal curvature of its edge being in the outer and upper quadrant and the other in the outer and lower quadrant. The lower and outer coloboma was the larger. There was nothing in her condition to lead me to suspect any defect in the least. The asthenopic symptoms were clearly due to her astigmatism and to an exophoria of 2°.

Kaempffer concludes that coloboma of the lens occurs more frequently than is generally supposed. This is due to the fact that it occurs in eyes which have good or fairly good vision and the defect is not sought for. This certainly is true of my case, as it was only by accident that I noticed the peculiarity of the lens.

Eyes with this defect are almost always myopic and often so in a high degree. Seldom are they emmetropic or hyperopic. In my case there was mixed astigmatism.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

JOHN TWEEDY P. R. C. S., President in the Chair.

Thursday, February 9th, 1905.

EXOSTOSIS OF THE ORBIT.

MR. EDGAR STEVENSON read a paper on a case of orbital exostosis.

The patient, a girl aged 22, was seen on November last with proptosis, well marked downwards and outwards, in the left eye. It had been first noticed six months previously, and its increase had been rather rapid. She had no pain except an occasional neuralgic twinge, the eye movements were unimpaired, the vision was normal and there was no diplopia. Under chloroform a small hard mass was felt lying under the outer and upper margin of the orbit. Upon operation it was found to be much larger than was expected; attached to the inner angle of the orbit, with its base in the frontal sinus, it extends right across the roof of the orbit. It was of cancellous tissue with a shell so hard that two drills were broken in an attempt to get into it; however, a small piece was removed with a chisel and showed its structure. The attached base was not very broad and the growth was wrenched away without difficulty. It was of an irregular pear-shape, weighing 351 gr., and measuring 1½ in. in its largest diameter. The patient made an excellent recovery; no eye affection remaining.

MR. A. OGILVY related notes of a case of large exostosis of the orbit. The patient, a healthy man aged 24, had no history of any ailment, and a good family history. When first seen, in November, he complained of epiphora, but on

examination a large hard mass was felt in the right orbit, evidently attached to the nasal side. The tumor was causing myopia and some choroidal changes. It had two pedicles, and its removal by operation proved difficult. The patient made an uninterrupted recovery, but diplopia was present; this, however, passed off in two weeks. The questions which the case raised were these:—(1) What was to be done with his disorganized lacrimal apparatus? (2) Did the tumor cause the myopia which had now disappeared? (3) Were these due to hereditary syphilis, as stated by Charles Stedman Bull? It was curious that so large a tumor could exist in such a small space as the orbit without causing more damage and discomfort than it did.

THE TREATMENT OF TOBACCO AMBLYOPIA.

Mr. Wray read a paper an the treatment of tobacco amblyopia. He divided the cases into three groups: (1) Those with amblyopia only; (2) those with amblyopia and tachycardia; and (3) those with tachycardia only. He urged that in view of the tendency to cardiac failure the pulse should always be examined. He had recently seen cases where the pulse ranged from 96 to 135, and patients suffering from tobacco poisoning should be warned that tachycardia might develop. The amblyopia usually disappeared if taken early, but by all the recognized treatments recovery was a slow process. As regards the tachycardia, he had seen several cases where it had persisted even after tobacco had been given up for years. He alluded to the toxic breath which was always present with amblyopia, but never when tachycardia was the sole symptom. He ascribed the amblyopia as probably due to saturation of the blood with tobacco alkaloids, and the tachycardia as due to injury or destruction of the cardio-inhibitory neurons of the trachea and bronchi, while bad teeth and a catarrhal condition of the alimentary and respiratory tracts aided the absorption of the poisons. Being much dissatisfied with the orthodox treatment with pot. iod. and strychnine, and considering that nicotine was freely soluble in water, he had suggested the following treatment. The patients were directed to dress warmly and drink a pint of water at 7 a. m., and walk briskly for thirty minutes in the

open air. Then to drink a second pint and go for a similar walk. Then rest for a few minutes and take breakfast. A third pint was to be taken in the middle of the morning, and a fourth in the middle of the afternoon. Some had even continued to smoke as much as ¼ oz. a day, and in three cases practically normal vision was restored in fourteen days. As regards the effect of the water treatment on the heart, the author had not had the opportunity of trying it on the new cases he had lately seen, for this had not been a marked symptom in them, but unquestionably the accelerated beat he had noticed had not disappeared in the same way as the amblyopia. There was a considerable doubt as to the method in which nicotine was eliminated, but he thought that it was mostly by the kidneys, though the lungs and skin probably bore a share. The water treatment had the advantage of utilizing all three ways.

NEURO-FIBROMA OF THE EYEBALL AND ITS APPENDAGES.

Messrs. E. Treacher Collins and Rayner D. Batten read a paper on neuro-fibroma of the eyeball and its appendages. The case which formed the basis of the paper was a girl aged 14, who had been under Mr. Batten's observation for three years. The right eye was buphthalmic with vision of $^1/_{60}$. There was also much hypertrophy of the upper lid. There was a doughy swelling over the right temporal fossa. The condition dated from birth. This unsightly eye was excised together with a wedge-shaped piece of the upper lid. The microscopical condition of the lid showed it to be a case of congenital elephantiasis associated with plexiform neuroma. The chief interest centered in the eye, for it was the fourth case recorded in which neuro-fibroma of the eyelid had been associated with a buphthalmic eyeball. This condition, however, did not seem to be due to fibromatosis of the ciliary nerves, but to increase in the tension, due, as in another case recorded by Mr. Collins, to congenital adhesion of the root of iris to the back of the cornea. The terminal nerves in the cornea were, however, thickened. The condition seen in the choroid had not before been noted. Throughout its structure was denser than normal, and in parts it was considerably thickened. It was chiefly composed of fibrous tissue, highly

nucleated, with pigment cells present, and very few blood vessels. Numerous small oval bodies presented the appearance of enlarged nerve ends. By comparison with the other cases recorded it was shown that all portions of the ciliary nerves supplying the eye might be affected with congenital fibromatosis, and that the uveal tract, like the skin, might be affected with a general hyperplasia of the fibrous tissue, though the extent of the affection varied. In some cases only the terminal filaments and end organs were involved, and in others the larger trunks were also affected.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

A clinical evening was held on March 9th, Mr. John Tweedy, President, in the chair. Among the cases shown were the following: Mr. Edgar Chatterton: A woman, aged 38, who had the inner canthi, caruncles, and innermost extremity of the lower palpebral conjunctivae discolored and of a dark grey appearance. As far as she knew this appearance had always been present. She had never had her lids treated with anything, neither had she any sign of old disease. Her occupation consisted of filling toy crackers with fulminate of silver, and she had done this work for years. Mr. Chatterton suggested that the silver salt had got into the eye and had caused the discoloration shown.—Mr. Charles Blair: A case of retinitis proliferans in a woman aged 59. The vision of the left eye was suddenly lost six months ago. The right fundus showed changes suggestive of albuminuria with numerous retinal hæmorrhages. The urine was, however, free from both albumen and sugar.—Mr. A. Ogilvy: Case of pemphigus of the conjunctiva in a farm laborer, who for failing health went to Canada. Shortly after getting there he suffered from pemphigus, the attack lasting for six weeks. He remained well for six weeks, and then returned to Eng-

land, at which time he could see to read with ease. On the passage home he had another attack, which was very severe. The eyes got rapidly worse, and now the corneæ were seen to be opaque, and the conjunctiva was so shrunken that but a little sac remained and the entropion was most troublesome. Lanoline applied to the eyes gave great relief.—Messrs. Lawson and Parsons: A drawing of a case of sarcoma of the choroid which occurred in a man aged 34. He had had a squint for two years, and the sight of the right eye had been failing for a year, and when first seen it was almost blind. For three months a black swelling had been present on the sclerotic, and this was increasing rapidly in size, and had much the appearance of a staphyloma. The eye was blind and the lens was opaque. The eye was removed, and on section a large sarcoma was found, which was thin and flat, and not at all like the choroidal sarcoma that is commonly seen. —Mr. Halliburton McMullen: A child aged 9 months, in whom an occasional upward deviation of the eye had been noticed since birth. On examination it was found that there was complete absence of downward rotation of the right eye, the movements in other directions were normal. On looking downwards the left eye fixed, while the right eye was rotated upwards and outwards, and was slightly retracted; the eyelid at the same time became elevated and retracted. The inferior rectus, and possibly also the superior oblique, were defective.—Mr. R. E. Bickerton: Changes in the optic disc, retina, and choroid in a patient aged 15. When first seen in July last he had a well-marked neuritis in the right eye, with surrounding retinitis. The disc, when shown, was raised, and of a bluish-white color, with a wool-like margin. There were also numerous fundus changes.—Mr. Charles Wray: A man who had improved considerably while under the treatment for tobacco amblyopia which he described at the last meeting of the Society. It consisted briefly in making such patients take brisk walks and drink large quantities of water.—(*Brit. Med. Jour.*)

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. Shoemaker, M.D.

St. Louis, Mo.

THE NEW OPHTHALMOLOGY AND ITS RELATION TO GENERAL MEDICINE, BIOLOGY AND SOCIOLOGY.

George M. Gould (*Jr. Am. Med. Ass.*, Nov. 19, 26), discussing this subject at length, points out that while the "old ophthalmology" was mostly concerned with the operations on and inflammations of the eye and with the ocular results of systemic disease, the "new ophthalmology," taking account of these things also, is, however, particularly interested in the effects on the general system of *eyestrain* caused by the use, particularly for near work, of eyes that are not entirely normal optically.

The small variation of $^1/_{300}$ of an inch in the measurements of the eyeball, or a slight unequal curvature of the cornea may be sufficient to handicap the individual in the struggle for some occupations, or may cause him to be a great sufferer.

It does not always do this, the simple law, however, being that the greater the ametropia the more limited the range and choice of occupations, while the lower errors of refraction cause pain and illness.

Eyestrain being only functional, its results are, to begin with, at least, the same. Many nervous and psychic troubles, as well as disorders of nutrition, when caused by eyestrain, are at first entirely functional, while some of the more severe diseases which sometimes result, directly or indirectly from eyestrain, have also at first a period of functional disorder, where remedies are effective, preceding the organic, inflammatory and incurable condition.

Gould claims that the scientific correction of ametropia prevents the great majority of eye diseases. The great proportion of ocular diseases are: those of the extrinsic muscles; inflammations of the conjunctiva, cornea, and iris; glaucoma;

high and increasing myopia; cataract; and all of these are frequently caused by ametropia. This one condition, then, is the prolific cause of many eye diseases, and the ophthalmic surgeons and therepeutists have begun to see that prevention is better than cure, and are becoming refractionists.

It is an important truth that each function of the body is dependent on other functions, and the specialist must ever be watching for lines of cause and effect running back and forth between the disease he is treating and those of all other specialties.

As the condition of the eyes affects the physiology of the system, so does physiology pass into pathology and so must pathology merge into biology. Since vision is one of the necessary conditions of self-motility it is evident that all nutrition, safety, attack and defense, free-moving and effectual doing is accomplished by seeing. Thus the evolution of the eye made possible the evolution of the race. In this evolution accuracy of sight is a prime law. The child who can not see accurately becomes, to say the least, a very different man or woman from the one who has good vision. Such are the backward scholars in school, who in a large part are the failures in life, and society's expensive degenerates, defectives, and dependents. They increase with every step of civilization, because each such step means the difficulty of added near vision.

A SIMPLE OPERATION FOR SENILE ENTROPION.

Clark W. Hawley (*Jr. Am. Med. Ass.*, Oct. 15) describes a simple operation for senile entropion, where you have to deal with the entire folding in of the lid and not with the contraction of the cartilage.

He threads a heavy piece of silk with two needles; then, clamping the lid, injects a few drops of 4 per cent. cocain into the skin: removing the clamp, he inserts one needle just below the margin of the lid, about the center, and carries it down and outward slightly and as close to the cartilage as possible, catching up the periosteum on the margin of the orbit and brings it out on the skin. The other needle is inserted about three millimeters distant from the first entrance and carried down parallel to the first thread, passing through

the periosteum and coming out near the exit of the first. The two ends are tied over a piece of cotton with sufficient tension to retain the lid in position, and allowed to remain so for two days, when the loop is fished out from the skin, and every day the threads are drawn back and forth. At the end of two weeks a heavy band of cicatricial tissue is formed, when the threads are removed, the lid being held firmly in position.

No claim is made for originality.

INTRAOCULAR HAEMORRHAGE.

A. H. Griffith (*British Med. Jr.*, Nov. 12) says that primary intraocular haemorrhage may occur from the following general conditions: 1. Blood changes. Infective endocarditis, pyaemia, septicaemia, purpura, scorbutus, and pernicious anaemia. Other toxic conditions, as phophorus poisoning and parasitic blood affections. 2. Diseased state of finer bloodvessels. 3. Back pressure of cardiac disease. 4. Embolic processes and thromboses. The author has never seen spontaneous haemorrhage into the anterior chamber of the eye. In 6,500 consecutive eye cases there were only 33 cases of spontaneous haemorrhage—0.5 per cent.

INVESTIGATION ON THE COMPARATIVE VISUAL ACUITY OF SAVAGE AND CIVILIZED PEOPLE.

W. H. Rivers (*British Med. Jr.*, Nov. 12), after examining a large number of people of all nationalities and tribes, has come to the conclusion, apart from errors of refraction, that man everywhere has practically the same amount of vision, and that in instances in which savages appear to possess greater visual acuity than white men, it is entirely due to practice and education, and to their being familiar with their surroundings.

HAAB'S GIANT MAGNET THE BEST MEANS TO EXTRACT FROM THE VITREOUS STEEL OR IRON WHICH ENTERED THROUGH THE CORNEA.

N. J. Weill (*Annals of Ophthalmology*, Oct.) cites a few examples illustrating the ease with which the Haab magnet attracts, from the vitreous into the anterior chamber,

splinters of steel or iron, without injury to the crystalline lens. He says there is no danger of the magnet attracting too forcibly, since the strength of the magnet can be regulated with a rheostatic arrangement. In all cases the pupil should be dilated to its maximum in order that the iris shall not interfere with the passage of the splinter into or from the anterior chamber. When the steel is anterior to the vitreous the corneal route is the natural one for its extraction and, if possible, this should be accomplished without the entry of any portion of the instrument into the anterior chamber.

In those cases where the splinter enters the vitreous via the sclera, in which there is promise of some vision, it should invariably be extracted with the giant magnet, around the lens and through the cornea. In the first case cited a small pyramidal splinter pierced the cornea and iris without injury to the lens and lodged in the vitreous from whence it was extracted five days later. The giant magnet guided it forward around the lens, where it caught in the pupillary portion of the iris, although the pupil was dilated ad maximum. An iridectomy was done and the splinter extracted. In a second case an exceedingly small splinter, which had penetrated the crystalline lens and had lodged in the vitreous, was extracted two days after the injury. The vision in both cases is improving.

HEREDITY AND TREATMENT OF SQUINT.

Cohn (*Berliner Klinische Wochenschrift*) tabulates the statistics gleaned from his personal experience in respect to the heredity of squint. The more he inquired the larger the proportion of squint in the family history. Out of 27,000 patients he found 805 with squint and there was a history of squint among the relatives in 16 per cent. of the first series, 25 per cent. in the second, and 33 per cent. in the last. The various relatives were parents in 25 per cent., grandparents in 7 per cent., brothers or sisters in 26 per cent., and uncles or aunts in 12 per cent., a total of 172 relatives with convergent squint to 805 patients with the same. Worth's statistics show 52 per cent. heredity and Jensen's 70 per cent. In all Cohn's hereditary cases the squinting eye exhibited hyperopia, which he cites as a significant fact. He thinks

there is probably some unknown factor at work here, possibly a congenital alteration in the internus, which ophthalmologists will do well to seek. We are not positive even as to whether amblyopia is cause or effect of the squint. In regard to treatment he follows the following principles: 1, up to the fourth year he has the sound eye bandaged for a few hours every day while the child is at play; 2, during the fifth year he commences special exercises with convex glasses and the stereoscope; 3, corrects total hyperopia; 4, refrains from operating until the child is 10 years old, and does tenotomy in the sixth year only in case of great disfigurement; he promises improvement but not total cure, and advances the externus in extreme degrees of squint.—(*Jr. Am. Med. Ass.*)

ALLEGED LOSS OF VISUAL POWER IN SCHOOL CHILDREN.

R. A. Katz (*Roussky Vratch*, Oct. 6) maintains that the nervous irritability and the depression which overstudy, especially before examinations, produces in school children, may give rise to a neurasthenic condition in which loss of vision is the effect of auto-suggestion. He reports that of 623 children of school age whom he had examined 2.89 per cent. had defects of vision which were the results of autosuggestion or malingering, having no real visual defect. The great majority were girls and there were only two boys among the eighteen cases reported. This shows the difference between the resistance of the nervous systems of the boy and the girl. It is difficult to say in how many of these cases the defect of vision is caused by autosuggestion, and in how many others it is simply a result of malingering. In a few of these cases there was simply malingering with the desire of obtaining glasses, or simply of exciting sympathy. In some of the cases also, both malingering and autosuggestion played a role.

The treatment of these cases should consist of the removal of the cause of autosuggestion, if this can be found. Sometimes foreign bodies in the eye, or other causes of irritation, induce the impression of diminished vision in school children.

A CASE OF CONGLOMERATE TUBERCLE OF THE CHOROID.

T. R. Pooley (*Med. Record*, Nov. 26) reports a case of conglomerate tubercle of the choroid, with extension into the sclera and retina, and secondary glaucoma.

The patient was a man, aged twenty-six, all of whose brothers and sisters had died of pulmonary tuberculosis. He had suffered from pain and redness in one eye for a year, and for some time the condition was treated as a possible syphilitic process. When seen by the author the eye presented the usual symptoms of absolute glaucoma and there was no ophthalmoscopic reflex. The other eye was normal. The eye was enucleated the same day and the patient's recovery was uneventful. Microscopical examination showed that the process was well advanced and tubercle bacilli could be demonstrated in stained sections. Now, one year after operation, the patient is in good health and there is no evidence of any pulmonary involvement.

A CLINICAL AND STATISTICAL STUDY OF CONVERGENT STRABISMUS.

Wendell Reber (*N. Y. Med. Jr.*, Nov. 5) concludes his article on this subject by offering the following tentative propositions as the result of his experience with esotropia:

1. Esotropia is most likely to manifest itself before the end of the third year.

2. It cannot yet be said whether any of the various reasons assigned by parents for the appearance of strabismus have aught whatever to do with it. Whooping cough may be related to it.

3. Heredity certainly plays a part in bestowing upon some children a congenitally deficient visual apparatus.

4. The degree of deviation will average about 30° in a large number of cases. It is in no special way bound up with the degree of refractive error.

5. The amblyopia of esotropia is presumably an amblyopia ex anopsia, the present day evidence being against Schweigger's theory of a congenital amblyopia.

6. The degree of amblyopia increases with the length of time elapsing between the appearance and the time of treatment; especially is this true after the seventh year.

7. Improvement may be expected in the amblyopic eye in fifty to sixty per cent. of cases by properly adjusted glasses. This improvement varies from twenty per cent. to ninefold betterment.

8. While a defectively developed fusion apparatus has much to do with the genesis of esotropia, the influence of hypermetropia and its allied states seems almost as important as in the days of Donders. The part played by astigmatism is no little one.

9. There seems to be no special relation between the degree of refractive error and the degree of deviation.

10. Hypermetropic conditions of from one to four dioptrics seem most commonly associated with esotropia.

11. A very high degree of hypermetropia does not necessarily exclude strabismus, as three cases in the series here presented were of 11 D. and over.

12. If taken before the fifth year, there seems no reason why the strabismus should not be cured by non-operative methods in seventy per cent. of cases. This percentage will, in all probability, be increased to eighty per cent. in the next ten years.

13. The results of non-operative treatment in children, if adhered to with any persistence, are infinitely better than any "scissors" statistics thus far offered.

NON-OPERATIVE TREATMENT OF TRACHOMA.

Frank Judson Parker (*Med. Record*, Sept. 17th) sums up his advice for the treatment of trachoma as follows: Surgical treatment should be advised only in those cases in which frog's spawn granulations are present. It should always be followed by after treatment. Operation should not be performed in cases in which the hard, deep seated granulations are present on account of the injury done to the conjunctiva in removing them. The habits and general condition of the patient are very important features to consider in preventing spread and effecting cure. The non-operative treatment is bichloride rubbing, with the use of one of the organic silver solutious night and morning. In the hard variety, the use of copper sulphate and the silver solution.

AMERICAN OPHTHALMOLOGICAL SOCIETY

The forty-first Annual Meeting of the American Ophthalmological Society was held this year on Thursday and Friday, the 11th and 12th of May at the Boston Medical Library, Boston, Mass. The following papers were read:

(1) A case of flat melano-sarcoma of the choroid, with unusual clinical features. DR. C. J. KIPP.

(2) Concerning melanoma of the choroid, with the report of two cases. DRS. G. E. DE SCHWEINITZ and E. A. SHUMWAY.

(3) Metastatic carcinoma of the ciliary body. DR. C. W. CUTLER.

(4) The treatment of inoperable cases of malignant diseases of the orbit by the X-ray method. DR. C. S. BULL.

(5) The Sachs lamp for transillumination of the eye. DR. E. S. THOMSON.

(6) Remarks on the use of the Roentgen rays in localizing foreign bodies in the eyeball and orbit. DR. J. E. WEEKS.

(7) Improved surgical methods for the successful use of the electro-magnet. DR. R. SATTLER.

(8) The attractive power of the magnet upon steel alloyed with other metals. DR. W. M. SWEET.

(9) What are the so-called reflexes which can be properly referred to eye-strain? DR. L. HOWE.

(10) Regulation of treatment of conjunctival diseases by systematic bacteriologic study. DR. C. A. OLIVER.

(11) Symptoms presented by the different bacteriological types of acute conjunctivitis. DR. ALEXANDER DUANE.

(12) Relapsing iritis. DR. H. WOODS.

(13) Juvenile glaucoma. DR. R. SATTLER.

(14) A case of homonymous, left-sided, inferior tetartanopsia following toxic dose of salicylate of soda. DR. J. H. CLAIBORNE.

(15) Cyanosis retinæ. DR. W. C. POSEY.

(16) Acquired cyst of conjunctiva containing an embryonic tooth-like structure. DR. E. STIEREN.

(17) Variations in the facility of monocular lid-closure and the cause thereof. Dr. W. Rider.

(18) A case of strabismus convergens concomitans, with suppression of the image of the better (habitually non-squinting) eye. Dr. D. W. Hunter.

(19) A case of cystic sarcoma of the orbit—extirpation—recovery. Dr. H. F. Hansell.

(20) Certain congenital affections of the eye, coinciding with strong ante-natal impressions made on the mother. Dr. H. Derby.

(21) Lesions of the fundus of the eye due to ptomaine poisoning. Dr. C. S. Bull.

(22) Zonular cataract with irideremia; extraction of the lens, which had become entirely opaque, in the capsule—microscopical examination. Dr. F. N. Lewis.

(23) Value of the so-called high-frequency current in certain ocular conditions, with illustrative cases (preliminary report). Dr. J. C. Lester.

(24) A case of discoloration of the cornea by blood-pigment, and one of hæmorrhage into the cornea. Dr. O. F. Wadsworth.

(25) A case of epithelial corneal cyst, with microscopic and macroscopic specimens. Dr. J. H. Claiborne.

(26) Tumors of the conjunctiva and cornea. Dr. J. M. Ray.

(27) Vernal conjunctivitis in the Negro. Dr. Dunbar Roy.

(28) Photophobia. Dr. P. Fridenberg.

(29) A new test-type case. Dr. C. H. Williams.

(30) Some changes in the construction of eye instruments which have not been in the direction of improvement. Dr. S. Theobald.

(31) The pupils in dementia paralytica. Dr. Ward A. Holden.